

lines 3 and 4 of the first paragraph of the introduction, but does not describe operations of a specific actuator containing this material or its derivatives which expands linearly.

Concerning Kaneto, the Examiner stated that in Col. 1, lines 28-35, Kaneto et al. discusses an electrochemical actuator comprising a high-conductivity conjugated polymer having an element that actuates by linear extension/contraction, but that Kaneto does not describe how their high-conductivity polymer is prepared nor does it describe its electrical conductivity range. The Examiner concluded by stating that it would have been obvious to use the high-conductivity polymer of Satoh et al. in the device described in Kaneto et al. in order to achieve the high electrical and mechanical properties such a material allows. Applicants respectfully disagree with the Examiner concerning this ground of rejection for the reasons to be set forth hereinbelow.

Claims 4 and 5 were rejected under 35 U.S.C. 103(a) as being unpatentable over Satoh et al. in view of Kaneto et al., since the Examiner stated that although the combination of these references does not set forth specific derivatives that generate high-conductivity conjugated polymers when polymerized, Col. 2, lines 57-64 of Kaneto et al. teaches the use of derivatives including alkyl in an electrochemical device, which device flexes but does not apparently expand in a linear direction. The Examiner then concluded that it would have been obvious to one having ordinary skill in the art to employ the derivatives noted by Kaneto et al. in the combined device noted above by the Examiner because these materials can be made into controllably deformable actuators as Kaneto et al. note at Col. 1, lines 58-63. Applicants respectfully disagree with the Examiner concerning this ground of rejection for the reasons to be set forth hereinbelow.

The Examiner further identified certain prior art as pertinent to the applicants' disclosure, but did not apply these references to the pending claims. Therefore, applicants believe that no response is required.

Reexamination and reconsideration are respectfully requested.

Briefly, the present invention includes the preparation of highly conductive conjugated polymers and their use as actuators. As defined in the Merriam-Webster Dictionary (Merriam-Webster OnLine), "expand" means "increase the extent, ..., volume, or scope of." There is no requirement for linear expansion. Additionally, Col. 1, lines 28-35 of Kaneto et al. state: "Conductive polymers such as polyaniline, polypyrrole, and polyacetylene can increase their electrical conductivity from the insulator to metallic regime upon the occurrence of certain chemical or electrochemical doping reactions. These reactions have been shown to be accompanied by a change in the volume of the polymer, such that the polymers can be manipulated to expand or contract." Applicants wish to respectfully point out that there is no mention in Kaneto et al. of linear expansion or contraction as is required in subject claim 1, as amended in Amendment A which was filed by applicant on June 12, 2003, by the phrase "wherein said element actuates by linear extension/contraction. Moreover, in lines 24-30 of Col. 7 of Kaneto et al., it is stated that: "Further, actuators **10, 40** can additionally be operated in a mechanoelectrical mode. A force can be directed against the actuators to impart bending or the actuator. This induced bending generates an electrical current that can be directed to flow to the control means **20**. When the force is removed, and the actuator allowed to resume its neutral position another electrical current can be generated." If the actuators of Kaneto et al. were intended to be utilized in the linear extension mode, it would be expected that there would be some mention that a linear motion would be effective for generating an electrical current. Additionally, the Examiner has stated in the rejection of claims 4 and 5 in the subject Office Action that "Kaneto et al. however in their DETAILED DESCRIPTION OF THE INVENTION at Col. 2, lines 57-64 use of derivatives including alkyl in an electrochemical device, which device flexes but does not apparently expand in a linear direction." (Emphasis added by applicants).

Moreover, Fig. 6 of Kaneto et al. shows that a maximum conductivity of < 100 S/cm is achieved by protonation of the polyaniline film (See also, Col. 8,

lines 18-20 of Kaneto et al.), whereas claim 1 of the present claimed invention requires an electrical conductivity of ≥ 100 S/cm.

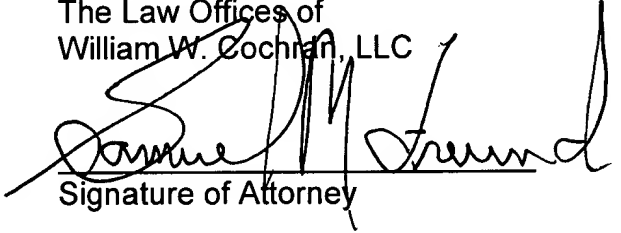
Applicants therefore believe that Kaneto et al. teaches away from the present claimed invention. Further, applicants believe that the Examiner has improperly combined Kaneto et al. with Satoh et al., since there would be no motivation for a practitioner of the invention of Kaneto et al. to seek the higher polymer conductivities identified in Satoh et al.; that is, the actuators of Kaneto et al. appear to perform their intended functions with conductivities of < 100 S/cm. Additionally, applicants have failed to locate the reference to polyaniline in lines 3 and 4 of Satoh et al. as suggested by the Examiner. Thus, applicants believe that the Examiner has failed to make a *prima facie* case for an obviousness-type rejection under 35 U.S.C. 103(a).

For the reasons set forth hereinabove, applicants believe that currently pending claims 1 and 3-5 are in condition for allowance, and such action by the Examiner at an early date is earnestly solicited.

Respectfully submitted,

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